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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,575	09/30/2003	Leonard J. Olmer	Bever 2-3-16-20/075903-8	9967
29391	7590	04/12/2006	EXAMINER	
BEUSSE WOLTER SANKS MORA & MAIRE, P. A. 390 NORTH ORANGE AVENUE SUITE 2500 ORLANDO, FL 32801			EL ARINI, ZEINAB	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/675,575

Applicant(s)

OLMER ET AL.

Examiner

Zeinab E. EL-Arini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-12, 14-20, 22-26, 28 and 30-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 14-20, 22-26, 28 and 30-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

The amendment and remarks filed 01/24/06 have been acknowledged and entered.

Specification

The objection to the specification stated in paper No. 091605 has been withdrawn in view of applicant's amendment.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-5, 7-12, 14-18, 22-24, 28, and 31-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. In claim 1, line 9, claims 11, 12, 17, 28, and 34, line 1, "steps" lacks antecedent basis.

4. In claims 3-4, 7-9, 14, 22-24, and 31, "step" lacks antecedent basis.

5. In claim 15, "step (c2)" lacks antecedent basis, because claims 14 or 1 do not include (c2).

6. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat.

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App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 23 recites the broad recitation less than, and the claim also recites about which is the narrower statement of the range/limitation.

The rejections stated in paper No. 091605 have been withdrawn in view of applicants' amendment and remarks.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2, 5, 7-12, 14-20, 22-26, 28, and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catalano (4,845,043) in combination with Fujisaki et al. (US 2004/0043570 A1) (new references).

9. Catalano discloses a method for manufacturing layers of semiconductor material comprising the steps of introducing a first reaction mixture comprising a silicon-

containing gas and a first doping gas into a deposition chamber; depositing a first doped layer comprising silicon in the deposition chamber from the first reaction mixture and forming gaseous residual contamination comprising the unreacted first doping gas and its reaction products; contacting said gaseous residual contamination in the chamber with decontamination gas capable of reacting with the residual contamination and substantially removing the residual contamination from the chamber; and introducing a second reaction mixture comprising a silicon- containing gas into the chamber and depositing a second layer comprising silicon on the first doped layer. See col. 3, lines 11-26. The decontamination gas is nitrogen trifluoride. See col. 5, lines 1-20, and col. 6, lines 36-60. The reference does not teach the temperature, the time, the flow rate, hydrogen termination and hydrogen bake as claimed.

10. Fujisaki et al. disclose a process and apparatus for producing semiconductor device. The reference discloses after forming a diffusion layer on the silicon substrate 13, a surface thereof is cleaned by chemical solution, thereafter subjected to a pretreatment by hydrofluoric acid diluted by de-ionized water to thereby remove native oxide formed on the surface of the substrate and form a hydrogen-absorbed layer referred as hydrogen termination. See paragraph 39. The reference also discloses when the Si substrate subjected to the hydrogen termination is heated, at 560 C. or higher, hydrogen atoms at the surface are evaporated and the silicon nitride film, which does not include Si-H bonds, is formed. See paragraph 45, and Fig. 5.

11. It would have been obvious for one skilled in the art to use the hydrogen termination and the depositing temperature taught by Fujisaki et al. in the Catalano

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process to improve the cleaning process. This is also because it is well known in the art to use the hydrogen termination step before depositing layer step. Subjecting the surface of the semiconductor substrate to hydrogen bake is well known in the art. It would have been obvious for one skilled in the art to adjust the flow rate and the time to obtain the claimed process.

12. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catalano in combination with Fujisaki et al. as applied to claims 1-2, 5, 7-12, 14-20, 22-26, 28, and 30-34 above, and further in view of Raaijmakers et al. (6,492,283) and Yates (6,350,322).

Catalano in combination with Fujisaki et al. as discussed supra do not teach cleaning the surface using RCA cleaning process and drying the surface with isopropyl alcohol as claimed.

Raaijmakers et al. disclose a method of forming ultrathin oxide layer on a surface of silicon substrate. The reference discloses the RCA cleaning process as claimed. See col. 1, lines 43-51, col. 5, line 66- col. 6, line 14, and col. 7, lines 5-10.

It would have been obvious for one skilled in the art to use the cleaning solution taught by Raaijmakers et al. in the process taught by Catalano in combination with Fujisaki et al. to obtain the claimed process, because it is well known in the art to use RCA solution in processing a semiconductor substrate.

The references as discussed supra do not teach drying the surface with the alcohol as claimed.

Yates discloses a method of reducing water spotting and oxide growth on a semiconductor structure. The reference discloses drying the substrate with alcohol as claimed. The reference discloses that chemical treatment, rinsing, and drying are carried out in a single vessel. See the abstract.

It would have been obvious for one skilled in the art to use the drying step taught by Yates in the process taught by the combination of the cited references to obtain the claimed process and to improve the cleaning process by removing any trace of the chemical cleaning solution remains on the surface of the substrate.

Response to Arguments

13. Applicant's arguments with respect to claims 1-5, 7-12, 14- 20, 22-26, 28, and 30-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeinab E. EL-Arini whose telephone number is (571) 272-1301. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Zeinab E. EL-Arini
Primary Examiner
Art Unit 1746

ZEE
04/10/06